

## Background Dossier Five

### Ben Franklin, Man of Many Talents

#### Benjamin Franklin: Spatial Intelligence

Benjamin Franklin enjoyed playing the game of chess. Chess is played on a game board with 64 squares, and each piece can move in its own unique way. The object of the game is to "checkmate" your opponent's king by blocking all routes on this piece's escape.

Franklin thought that life was like the game of chess, and that people could learn important lessons from it. Franklin said that chess developed the mind, taught how to be gracious whether you have won or lost the game, and taught how to deal with competition.

Try playing a game of chess, either on a real chess board or on the computer. Do you agree with Franklin that chess improves the mind and can teach life lessons?

*"The Game of Chess is not merely an idle amusement. Several very valuable qualities of the mind, useful in the course of human life, are to be acquired and strengthened by it, so as to become habits ready on all occasions for life is a kind of Chess, in which we have points to gain, and competition or adversaries to contend with, and in which there is a vast variety of good and ill events that are, in some degree, the effect of prudence, or want of it. By playing at Chess then, we may learn: First, Foresight... Second, Circumspection... Third, Caution...*

*And lastly, we learn by Chess the habit of not being discouraged by present bad appearances in the state of our affairs the habit of hoping for a favorable chance, and hat of persevering in the secrets of resources."*

*-Benjamin Franklin, 1779*

## Benjamin Franklin: Naturalist Intelligence

Benjamin Franklin was curious about the world around him. He wondered about whether lightening was electricity, about how ocean currents affected traveling ships, and about how stoves could best spread heat and light.

Franklin created inventions that improved people's lives, like bifocal glasses, the lightening rod, and the Pennsylvania stove. He also was concerned about pollution and the environment, and wrote letters about the deplorable state of Dock Creek in Philadelphia, which was like an open sewer. Franklin insisted that Dock Creek was a health hazard and that the tanneries that were dumping their waste into it should have to move or the creek should be covered over.

Take a look at some of the ways that Franklin tried to make people's lives better through his inventions and studies of how nature worked.



### The Pennsylvania Stove ("Franklin Stove")

Fireplaces were the main source of heat for homes in the 18<sup>th</sup> century, but most fireplaces of the day were not very efficient. They produced a lot of smoke and most of the heat that was generated went right out the chimney. Sparks in the home were of great concern because they could cause a fire that would quickly destroy the homes, which were constructed mainly with wood. Franklin developed a new style of stove with a hood-like enclosure in the front and an airbox in the rear. The new stove and reconfiguration of the flues allowed for a more efficient fire, one that used one quarter as much wood and generated twice as much heat. When offered a patent for the fireplace's design, Franklin turned it down. He did not want to make a profit. He wanted all people to benefit from his invention.

### The Lightning Rod

In 1752 Franklin conducted his famous kite flying experiments and proved that lightning is electricity. During the 1700s lightning was a major cause of fires. Many buildings caught on fire when struck by lightning and kept burning because they were built mainly of wood.

Franklin wanted his experiment to be practical, so he developed the lightning rod. A tall rod is attached to the outside wall of the house. One end of the rod points up into the sky; the other end is connected to a cable, which stretches down the side of the house to the ground. The end of the cable is then buried at least ten feet underground. The rod attracts the lightning and sends the charge into the ground rather than the house, which helps to decrease the amount of fires.



## Benjamin Franklin: Musical Intelligence

Benjamin Franklin loved to listen to music. He invented a musical instrument called the glass armonica. Franklin had attended a concert in England in which music was produced by moving wet fingers around the rims of wineglasses. In 1761, Franklin used this basic idea to create his own musical instrument, which was made up of 37 glass bowls of different sizes, stacked one on top of the other and then laid horizontally across the table then attached to a foot pedal. By using the foot pedal, the musician could spin the bowls and produce sounds by pressing on the glasses with their wet fingers. Franklin played his glass armonica and so did many other 18<sup>th</sup> century musicians. Mozart and Beethoven wrote music for the glass armonica.

Go to <http://fi.edu/franklin/musician/musician.html> or [http://www.pbs.org/benfranklin/l3\\_inquiring\\_glass.html](http://www.pbs.org/benfranklin/l3_inquiring_glass.html) and listen to the armonica music. What does it sound like? Does it remind you of any other sounds? Are the sounds pleasing to your ear?

*"I play some of the softest Tunes on my Armonica, with which Entertainment our People here are quite charmed and conceive the Scottish Tunes to be the finest in the World. And indeed, there is so much simple Beauty in many of them, that my Opinion they will never die, but in all ages find a Number of Admirers."*

*-Benjamin Franklin, December 11, 1763*



## Benjamin Franklin: Logical-Mathematical Intelligence

Benjamin Franklin struggled in his math classes in school. But when he was older and had the job of Clerk of the General Assembly of Pennsylvania, he would often get bored and like to figure out magic squares to keep his mind sharp.

Magic Squares are math puzzles. The number in each row of the square (horizontal, vertical, and diagonal) will add up to the same exact number if the square is a Magic Square.

Look at the squares below. Add the numbers in each row to make sure that these are really magic squares. Here are two finished examples below. What number does each one add up to?

			1	15	14	4
8	1	6				
			12	6	7	9
3	5	7				
			8	10	11	5
4	9	2				
			13	3	2	16

*"What science can there be more noble, more excellent, more useful for men, more admirably high and demonstrative, than this of the mathematics?"*

*-Benjamin Franklin*

## Benjamin Franklin: Intrapersonal Intelligence

Benjamin Franklin was very interested in improving himself. He read many books and tried to take lessons from them on how to live a better life. Franklin even created a self-improvement plan that he tried to follow. In his plan, Franklin made a list of thirteen virtues he was trying to follow and make a permanent part of his character. He focused on one virtue each week, and made marks in a notebook whenever he failed to live up to that virtue.

Franklin checked his virtue for the week each evening. He continued the program for over two years before he discontinued doing his nightly reflections. With thirteen virtues, he went through the cycle four times each year. In his autobiography he states that this self-improvement plan had a very beneficial effect throughout his life even though he didn't feel he had been entirely successful at achieving all the virtues he intended to. He admits that pride was the one most difficult for him to subdue, and that his failure was probably "for the better" since, had he "completely overcome it, I should probably be proud of my humility." (He would have been proud that he wasn't proud!)

Do you have a method for trying to improve yourself? Is it similar to Franklin's plan?

*"My list of virtues contained at first but twelve. But a Quaker friend having kindly informed me that I was generally thought proud, that my pride showed itself frequently in conversation, that I was not content with being in the right when discussing any point, but was overbearing and rather insolent - of which he convinced me by mentioning several instances - I determined endeavoring to cure myself, if I could, of this vice of falling among the rest, and I added humility to my list, giving an extensive meaning to the word."*

*-Benjamin Franklin, Autobiography*

## Benjamin Franklin: Interpersonal Intelligence

When he was a young man, Benjamin Franklin read many books and tried to take lessons from them on how to work well with others. Franklin tried to listen more than speak during conversations. He found ways to win an argument without yelling, but instead through patience, logic, and perseverance.

As a result, when he became an adult, Franklin worked well with others. He could cooperate and compromise in order to achieve his goals. He founded the Junto, which was a group of young tradesmen and artisans who wanted to improve themselves and their community in Philadelphia. Franklin was a delegate to the Continental Congress and helped draft the Declaration of Independence. Later, he traveled to France as a diplomat for the United States. Franklin was also able to help the members of the Constitutional Convention make compromises so that the United States Constitution could be created and approved.

Take a look at the revisions that were made to Thomas Jefferson's rough draft of the Declaration of Independence at <http://www.loc.gov/exhibits/treasures/trt001.html>. Franklin made some of these suggested changes, including changing "We hold these truths to be sacred and undeniable" to "We hold these truths to be self-evident".

How do you think that Jefferson felt while changes were being made to the document he drafted? How do you think Franklin might have encouraged him? (Check out the book *The Hatmaker's Sign* by Candace Fleming.)



## Benjamin Franklin: Bodily-Kinesthetic Intelligence

Franklin loved to swim! He developed an early version of swim fins. As a boy, he read a book about swimming and quickly taught himself the basic swimming strokes. He built himself wooden paddles for his hands and wooden fins for his feet to help him swim faster. He used a kite in the breeze to pull him along, making it easier to swim. He said that the swim fins helped him to swim faster and reduced what he called a "laborious and fatiguing operation."

Compare modern swim paddles and swim fins with the wooden versions that Franklin invented as a boy. What improvements have been made to swim fins and swim paddles today?





## Benjamin Franklin: Verbal-Linguistic Intelligence

Benjamin Franklin loved to read and write. He wrote in his autobiography that he did not remember a time when he could not read. As a boy, Franklin read books on many different subjects. He tried to improve his writing skills by rewriting passages from the books he has read. Sometimes Franklin rewrote a prose passage as poetry, or rewrote a poem as prose.

In the mid-1700s, Franklin produced Poor Richard's Almanac. In it, he included some witty phrases and sayings that people enjoyed. Some of these sayings (also known as maxims or aphorisms) were ones that Franklin had heard from other people, some were ones that he revised slightly, and some were sayings that Franklin made up.

Take a look at the sayings from Poor Richard's Almanac below. Can you translate these sayings into your own words? Do these sayings still hold true today?

- *He that lies down with the dogs shall rise up with fleas.*
- *The Things that hurt, Instruct.*
- *A True Friend is the best Possession.*
- *Speak little, do much.*
- *There was never a good Knife made of bad Steel.*
- *The Doors of Wisdom are never shut.*
- *A long Life may not be good enough, but a Good Life is long enough.*
- *Haste Makes Waste.*
- *Well done is better than well said.*
- *The most noblest question in the world is, What Good may I do in it?*
- *If you would not be forgotten as soon as you are dead and rotten, either write things worth the reading, or do things worth the writing.*